



DUCT SEALING

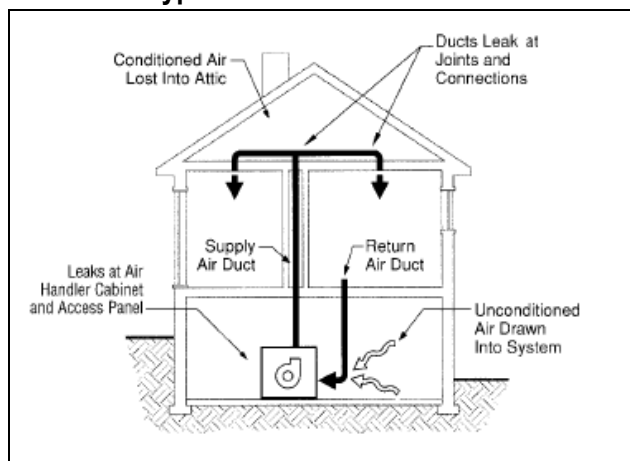
Heating and Cooling System Improvements

Air distribution system ducts are designed to supply conditioned air from heating and cooling equipment to the living spaces and return an equal volume of air from the living spaces back to the heating and cooling equipment to be reconditioned. However, residential ducts typically leak 15 percent to 20 percent of the air they convey.

Ducts are usually located in unconditioned spaces such as attics, crawlspaces, garages, or unfinished basements. The conditioned air that leaks out of the supply ducts is lost in the spaces where the ducts are located. Typically, heating and cooling equipment is designed to condition return air that is at or near room temperature. Leaky return ducts can draw air out of unconditioned spaces that is hotter or colder than the return air, thus increasing the work a heating and cooling system must perform to keep you comfortable. This problem is most pronounced in attics where, during the summer months, air temperatures can be 150° F or higher. Even when furnaces or air conditioners are not operating, leaky ducts waste energy by contributing to the overall air leakage of a house. Even in new, tightly constructed houses, ducts can account for 20 percent to 25 percent of the total air leakage. Leaky ducts located in unconditioned spaces can introduce airborne pollutants, moisture, and unpleasant odors into homes, thus reducing indoor air quality.

Duct leakage is the result of improper installation and poor materials. Duct tape, which is commonly used, does not adequately seal joints between ducts and has a short life. More stable and permanent materials are needed such as foil tape, fiberglass tape and mastic, or new advanced duct tape. Locating the ducts within the conditioned space can also improve system efficiency. Even when ducts are located within conditioned spaces, sealing is still required to assure proper distribution of air.

FIGURE 1: Typical Locations of Duct Leaks



EPA recommends proper sealing of air distribution ducts as a means of reducing energy consumption and improving indoor air quality. If properly sealed, the duct system in a house can significantly improve heating and cooling system efficiency and performance.

BENEFITS

Duct sealing can provide many benefits including:

Improved comfort. Duct sealing increases the amount of conditioned air that is distributed to every room in a home. The heating and cooling systems can operate more efficiently resulting in quicker recovery from night-time setbacks and a more consistent level of comfort throughout your home.

Improved indoor air quality. Leaky return ducts located in attics, unfinished basements, crawlspaces, and garages can draw pollutants such as dirt, dust, mold, fumes from solvents, radon gas, and carbon monoxide exhaust from cars into homes. Proper sealing of the return ducts can reduce the amount of airborne pollutants that enter homes and therefore improve indoor air quality.

Better humidity control. Air conditioning systems cool and dehumidify indoor air by recirculating it over an evaporator coil. Leaky return ducts can draw hot and humid air out of attics and crawlspaces and overwhelm the capacity of the air conditioner coil to cool and dehumidify the indoor air. Air that is not properly dehumidified can be uncomfortable and promote the growth of mold and mildew indoors.

Lower utility bills. The average homeowner spends about \$700 per year on heating and cooling. Duct sealing can reduce this cost by between \$70 and \$140 per year, making a home less expensive to operate.

Lower equipment costs. Duct sealing, in conjunction with a well designed air distribution system, and good insulation techniques can reduce heating and cooling loads which can allow the installation of smaller, less costly heating and cooling equipment.

ENERGY STAR® promotes the use of high-efficiency technologies and equipment to help homeowners improve the energy-efficiency of their homes. ENERGY STAR is sponsored by the U.S. Environmental Protection Agency and the U.S. Department of Energy.